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## Development of a multi-ring sample at the T2K far detector

The T2K experiment studies neutrino oscillations by measuring  $\nu_e$  appearance and  $\nu_\mu$  disappearance from a  $\nu_\mu$  beam. This is done by observing neutrino events at a near detector situated 280 metres from the beam production target, and at a far detector situated 295 km from the beam production target. Super-Kamiokande, a large water Cherenkov detector, acts as the far detector, where charged products of neutrino interactions on water are observed as rings of light. Neutrino oscillation analyses at T2K currently use single-ring events at the far detector. By introducing multi-ring events into the oscillation analysis, statistics can be significantly increased. This study explores a 2-ring  $\nu_e$  CC $1\pi^+$  sample, where an  $e$ -like ring and a  $\pi^+$ -like ring are produced. The event selection was developed using boosted decision trees. Preliminary results suggest a potential 12% increase in  $\nu_e$  appearance statistics.

### Mini-abstract

A multi-ring  $\nu_e$  CC $1\pi^+$  sample can be used to increase statistics at the T2K far detector.

### Experiment/Collaboration

T2K

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